

In the claims:

This listing of the claims replaces all prior versions in the application.

Claims 1. – 23. (Canceled).

24. (Previously Presented) A carbon nanotube comprising:
a dipole of pentagon-heptagon and heptagon-pentagon dislocation cores located in an
opposed spaced-apart relationship along a spiral propagation path along a longitudinal axis of
said carbon nanotube;
a first region comprising a domain of modified lattice structure positioned between
said dipole and formed by said dipole propagating throughout the nanotube as a result
of stress being applied to said nanotube; and
second and third regions each positioned on opposite sides relative to said first region, the
second and third regions comprising lattice structure domains which differ from the domain
of modified lattice structure in said first region such that said second and third regions
possess a physical property different from the first region.

25. (Currently Amended) An article of manufacture comprising: ~~the nanotube~~
~~defined in Claim 24.~~

a carbon nanotube comprising:

a dipole of pentagon-heptagon and heptagon-pentagon dislocation cores
located in an opposed spaced-apart relationship along a spiral propagation path along
a longitudinal axis of said carbon nanotube;

a first region comprising a domain of modified lattice structure positioned
between said dipole and formed by said dipole propagating throughout the nanotube
as a result of stress being applied to said nanotube; and

second and third regions each positioned on opposite sides relative to said first
region, the second and third regions comprising lattice structure domains which differ

from the domain of modified lattice structure in said first region such that said second and third regions possess a physical property different from the first region.

26. – 27. (Canceled).

28. (Previously Presented) The carbon nanotube defined in Claim 24, wherein the domain of modified lattice comprises a modified hexagonal lattice structure.

29. (Previously Presented) The carbon nanotube defined in Claim 24, wherein the domain of modified lattice structure propagates in an imaginary spiral line between said pentagon-heptagon and heptagon-pentagon dislocation cores.

30. (Previously Presented) The carbon nanotube defined in Claim 24, wherein said nanotube has a defined lattice structure characterized by a (10,10) chirality vector in at least one of the second and third regions, and wherein the domain of modified lattice structure has a chirality vector of (10,9).

31. (Previously Presented) The carbon nanotube defined in Claim 24, wherein said nanotube comprises carbon or boron nitride.

32. (Previously Presented) The carbon nanotube defined in Claim 24, wherein the physical property is an electrical property.

33. (New) The article of manufacture defined in Claim 25, wherein the article of manufacture comprises an infrared sensor for thermal imaging.

34. (New) The article of manufacture defined in Claim 25, wherein the article of manufacture comprises a nanoscale diode.

35. (New) The article of manufacture defined in Claim 25, wherein the article of manufacture comprises a photoelectric cell.

36. (New) The article of manufacture defined in Claim 25, wherein the article of manufacture comprises a nanoscale transistor for submicroelectric devices.

37. (New) The article of manufacture defined in Claim 25, wherein the article of manufacture comprises an integrated circuit device.

38. (New) The article of manufacture defined in Claim 25 further comprising a second carbon nanotube, the first and second nanotubes having a different diameter, the first and second nanotubes forming a layered concentric nanotube structure, the second nanotube comprising:

a second dipole of pentagon-heptagon and heptagon-pentagon dislocation cores located in an opposed spaced-apart relationship along a spiral propagation path along a longitudinal axis of said second carbon nanotube;

a fourth region comprising a domain of modified lattice structure positioned between said dipole and formed by said dipole propagating throughout the nanotube as a result of stress being applied to said nanotube; and

fifth and sixth regions each positioned on opposite sides relative to said fourth region, the fifth and sixth regions comprising lattice structure domains which differ from the domain of modified lattice structure in said fourth region such that said fifth and sixth regions possess a physical property different from the fourth region.